CDMS Project

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CD Project Status Meeting – Feb. 19, 2003

Introduction

- **CDMS** (Cryogenic Dark Matter Search: E891) - An experiment using germanium and silicon detectors operated at low temperature (90mK) at the Soudan Underground Facility to search for low energy nuclear recoils characteristic of interactions with candidate SUSY dark matter particles (*wimps*).

- **FNAL Personnel**: Don Holmgren, 25%

- **Deliverables**:
  - Linux device drivers and user space code to control VME and PCI-based instrumentation
  - an event builder integrated with slow control from UCSB
  - assistance with computing infrastructure (DAQ cluster, code management, configuration management)
  - potentially at FNAL, a data repository and analysis computing

Design

- Original experiment at Stanford consisted of a single tower of detectors, and a DAQ implemented in LabView on two Macintosh computers

- CDMS at Soudan will have up to seven towers - LabView won't scale to this size

- Requirements: 1 MB/sec in background mode, 20 MB/sec in calibration

- Elements of final design:

  – Event building over gigE with subevents gathered over PCI-VME bridges

  – Slow control implemented in Java

  – LabView GUI's ported to Java

  – Distributed design using a hybrid of CORBA and Java RMI
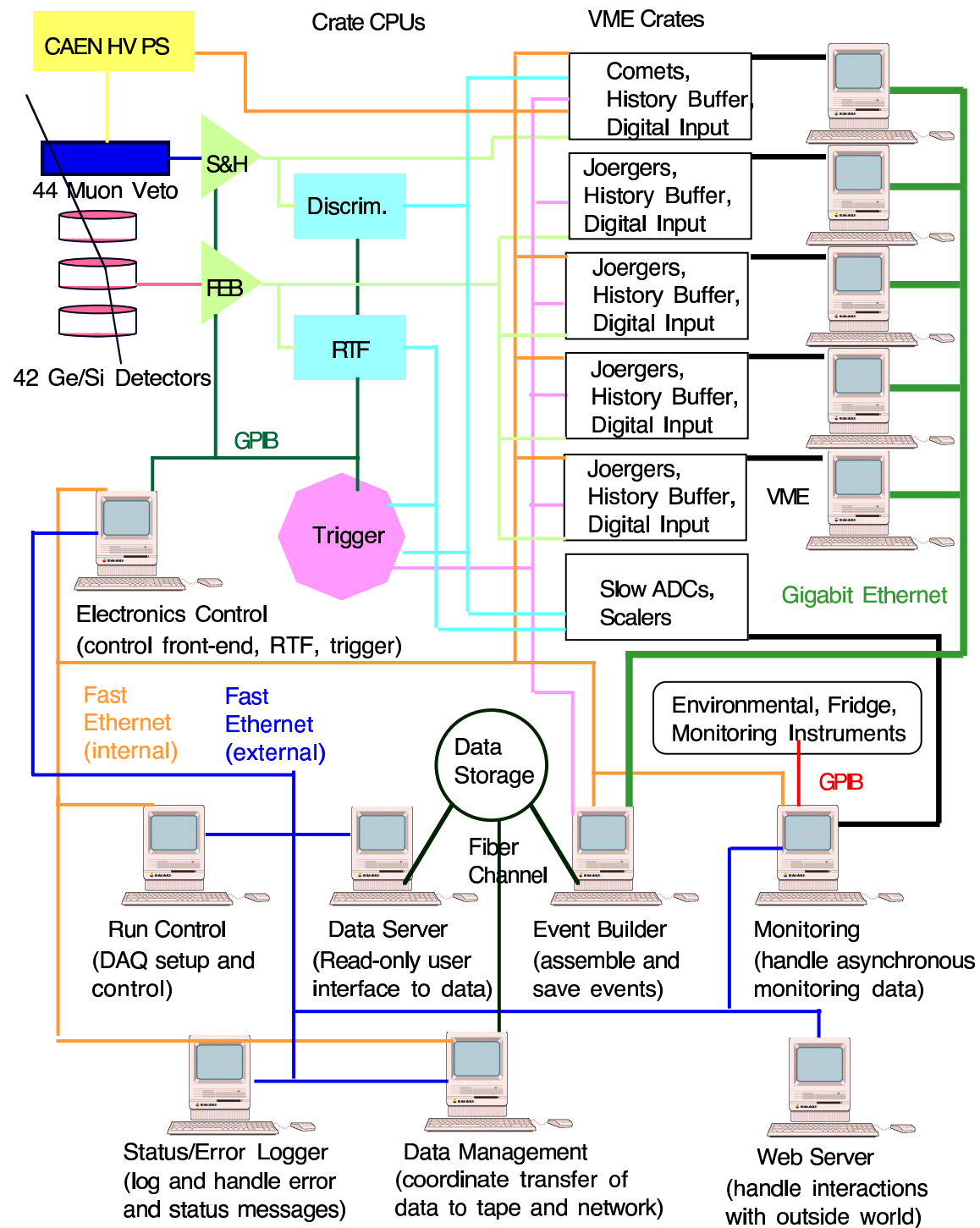
Status

- Original PCI-VME bridges were Bit3's - Linux device drivers for the Bit3, Joerger fast ADCs, and Struck history buffers were implemented

- Recently began switch to MBLT (D64) capable Struck digitizers and PCI-VME bridges - readout rates increased to 60 MB/sec from 20 MB/sec

- Linux device driver implemented for PCI digital I/O card (for trigger rearm, random and spare triggers)

- Event builder implemented, based on R2DM

  - have tested equivalent of 60 Hz trigger rate, require 10 Hz for calibrations

Schedule

- Currently in middle of commissioning at Soudan:

  – dilution refrigerator (finally) came on-line in November

  – began staging FNAL electronics and DAQ in December

  – expect to complete electronics installation this week

  – detectors to arrive late February

  – integration, and detector cooling and testing, expected to last through May

  – data taking to begin in June